

## Technology Overview

Ingress Replication for MVPN and for IP Multicast  
Using Next Gen MVPN

Release  
**12.1**



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## Introduction

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This document describes features and commands supported in Junos OS Release 10.4 and later that allow you to configure ingress replication provider tunnels for MVPN and for IP multicast using Next Gen MVPN (MBGP MVPN). This document provides configuration examples that you can copy and paste to create a sample configuration for your own system. There are also step-by-step configuration and verification examples provided.

## Example: Configuring Ingress Replication for IP Multicast Using MBGP MVPNs

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## Requirements

The routers used in this example are Juniper Networks M Series Multiservice Edge Routers, T Series Core Routers, or MX Series 3D Universal Edge Routers. When using ingress replication for IP multicast, each participating router must be configured with BGP for control plane procedures and with ingress replication for the data provider tunnel, which forms a full mesh of MPLS point-to-point LSPs. The ingress replication tunnel can be selective or inclusive, depending on the configuration of the provider tunnel in the routing instance.

## Overview

The **ingress-replication** provider tunnel type uses unicast tunnels between routers to create a multicast distribution tree.

The **mpls-internet-multicast** routing instance type uses ingress replication provider tunnels to carry IP multicast data between routers through an MPLS cloud, using MBGP (or Next Gen) MVPN. Ingress replication can also be configured when using MVPN to carry multicast data between PE routers.

The **mpls-internet-multicast** routing instance is a non-forwarding instance used only for control plane procedures. It does not support any interface configurations. Only one **mpls-internet-multicast** routing instance can be defined for a logical system. All multicast and unicast routes used for IP multicast are associated only with the default routing instance (**inet.0**), not with a configured routing instance. The **mpls-internet-multicast** routing instance type is configured for the default master instance on each router, and is also included at the **[edit protocols pim]** hierarchy level in the default instance.

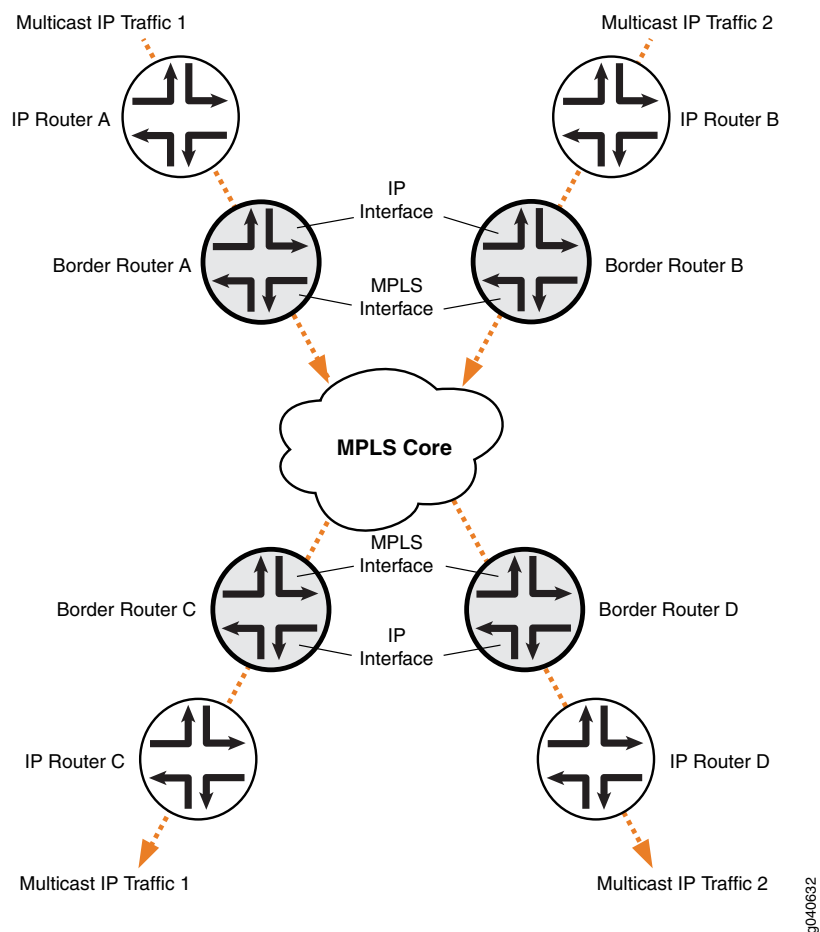
For each **mpls-internet-multicast** routing instance, the **ingress-replication** statement is required under the **provider-tunnel** statement and also under the **[edit routing-instances routing-instance-name provider-tunnel selective group source]** hierarchy level.

When a new destination needs to be added to the ingress replication provider tunnel, the resulting behavior differs depending on which mode has been configured for the tunnel:

- **existing-unicast-tunnel**—In this default mode, an existing unicast tunnel to the destination is used. If a unicast tunnel is not available, the destination is not added. This is the only mode available when using LDP LSPs and ingress replication.
- **create-new-ucast-tunnel**—When this mode is configured, a new unicast tunnel to the destination is created, and is deleted when the destination is no longer needed. Use this mode for RSVP LSPs using ingress replication.

The IP topology consists of routers on the edge of the IP multicast domain. Each router has a set of IP interfaces configured toward the MPLS cloud and a set of interfaces configured toward the IP routers. See [Figure 1 on page 2](#). Internet multicast traffic is carried between the IP routers, through the MPLS cloud, using ingress replication tunnels for the data plane and a full-mesh IBGP session for the control plane.

**Figure 1: Internet Multicast Topology**



## Configuration

### CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```

set routing-instances IM-A instance-type mpls-internet-multicast
set routing-instances IM-A provider-tunnel ingress-replication create-new-ucast-tunnel
set routing-instances IM-A provider-tunnel ingress-replication label-switched-path
  label-switched-path-template default-template
set routing-instances IM-A provider-tunnel selective group group-address source
  source-address ingress-replication label-switched-path
set routing-instances IM-A protocols mvpn
set protocols pim mpls-internet-multicast

```

#### Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see [Using the CLI Editor in Configuration Mode in the \*Junos OS CLI User Guide\*](#).

The following example shows how to configure ingress replication on IP multicast instance **IM-A** with the routing instance type **mpls-internet-multicast**. Additionally, this example shows how to configure a selective provider tunnel that selects a new unicast tunnel each time a new destination needs to be added to the multicast distribution tree.

1. Configure the routing instance type for IM-A to be **mpls-internet-multicast**.

```
[edit routing-instances]
```

```
user@host# set IM-A instance-type mpls-internet-multicast
```

2. Configure the ingress replication provider tunnel to create a new unicast tunnel each time a destination needs to be added to the multicast distribution tree.

```
[edit routing-instances]
```

```
user@host# set IM-A provider-tunnel ingress-replication create-new-ucast-tunnel
```



**NOTE:** Alternatively, use the **existing-unicast-tunnel** statement if an existing tunnel should be used each time a destination needs to be added. It is the only mode available when using LDP LSPs and ingress replication.

3. Configure the point-to-point LSP to use the default template settings (this is needed only when using RSVP tunnels).

```
[edit routing-instances]
```

```
user@host# set IM-A provider-tunnel ingress-replication label-switched-path
  label-switched-path-template default-template
```

4. Configure selective ingress replication provider tunnels.

```
[edit routing-instances]
```

```
user@host# set IM-A provider-tunnel selective group 232.1.1.1/32 source
  192.168.195.145/32 ingress-replication label-switched-path
```

5. Configure the MVPN Protocol in the routing instance.

```
[edit routing-instances]
```

```
user@host# set IM-A protocols mvpn
```

```
user@host# up
```

6. Add the **mpls-internet-multicast** configuration statement under the **[edit protocols pim]** hierarchy level in the master instance.

```
[edit protocols]
```

```
user@host# set pim mpls-internet-multicast
```

7. Commit the configuration.

```
[edit]
```

```
user@host# commit
```

8. Use the **show ingress-replication mvpn** command to check the ingress replication status.

```
[edit]
```

```
user@host# run show ingress-replication mvpn
```

```
Ingress Tunnel: mvpn:1
Application: MVPN
Unicast tunnels
  Leaf Address      Tunnel-type      Mode      State
  10.255.245.2      P2P LSP         New       Up
  10.255.245.4      P2P LSP         New       Up
```

9. Use the **show mvpn instance** command to show the ingress replication tunnel type.

```
[edit]
```

```
user@host# run show mvpn instance IM-A
```

MVPN instance:

Legend for provider tunnel

I-P-tnl -- inclusive provider tunnel S-P-tnl -- selective provider tunnel

Legend for c-multicast routes properties (Pr)

DS -- derived from (\*, c-g) RM -- remote VPN route

Instance : IM-A

MVPN Mode : SPT-ONLY

Provider tunnel: S-P-tnl:INGRESS-REPLICATION:MPLS Label 18:10.255.245.6

Neighbor S-P-tnl

10.255.245.2 INGRESS-REPLICATION:MPLS Label 22:10.255.245.2

10.255.245.7 INGRESS-REPLICATION:MPLS Label 19:10.255.245.7

#### Related Documentation

- [Configuring Routing Instances for an MBGP MVPN](#)
- [mpls-internet-multicast](#)
- [ingress-replication](#)
- [create-new-ucast-tunnel](#)
- [existing-unicast-tunnel](#)
- [show ingress-replication mvpn](#)